AMENDMENTS TO THE CLAIMS:

Following is a listing of all claims in the present application, which listing supersedes all previously presented claims:

Listing of Claims:

1. (Currently Amended) A closed loop transmission antenna diversity method employing a selective combining method when a plurality of antennas are used in a base station of a mobile communication system, the closed loop transmission antenna diversity method comprising the steps of:

(a) measuring channel information from signals ~~received through~~ transmitted from the plurality of antennas used in the base station and outputting a channel information matrix;

(b) transforming the channel information matrix according to a transform matrix composed of a complex basis vector set;

(c) calculating reception power with respect to the plurality of antennas based on the transformed channel information matrix; and

(d) transmitting antenna selection information obtained based on the calculated reception power to the base station as feedback information for controlling transmission antenna diversity.

2. (Original) The closed loop transmission antenna diversity method of claim 1, wherein the step (a) comprises measuring channel information using pilot signals set differently for the plurality of antennas.

3. (Original) The closed loop transmission antenna diversity method of claim 1, wherein the step (b) comprises the sub steps of:

(b1) calculating a first transformed channel information matrix from the channel information matrix using a transform matrix composed of a first basis vector set; and

(b2) calculating a second transformed channel information matrix from the channel information matrix using a transform matrix composed of a second basis vector set, and

the step (c) comprises the sub steps of:

(c1) calculating reception power based on the first and second transformed channel information matrices; and

(c2) detecting an element maximizing the reception power in the complex basis vector set.

4. (Original) The closed loop transmission antenna diversity method of claim 3, wherein the first and second basis vector sets are a Walsh basis vector set and a polar basis vector set, respectively.

5. (Original) The closed loop transmission antenna diversity method of claim 1, wherein the step (d) comprises alternately transmitting two indexes corresponding to a real part and an imaginary part, respectively, of a complex basis vector at feedback signaling intervals when an index corresponding to a basis vector included in the complex basis vector set is transmitted as the feedback information.

6. (Original) The closed loop transmission antenna diversity method of claim 1, wherein in the step (d) the feedback information signal comprises antenna selection information and phase information indicating a phase difference between antennas.

7. (Original) A closed loop transmission antenna diversity method employing a selective combining method, comprising the steps of:

(a) receiving in a base station selection information related to a complex basis vector from a mobile station;

(b) determining a complex basis vector selected based on the selection information;

(c) obtaining an antenna weight for each antenna using the determined complex basis vector; and

(d) generating a signal based on the antenna weight and transmitting the signal to the mobile station through a corresponding antenna.

8. (Original) The closed loop transmission antenna diversity method of claim 7, comprises the additional steps after step b):

(b1) receiving an index corresponding to an element of a complex basis vector set as the feedback information; and

(b2) selecting a complex basis vector corresponding to the index received in step (b1) by referring to a weight table in which an index is assigned to each element of a complex basis vector set composed of all combinations of first and second basis vector sets.

9. (Original) The closed loop transmission antenna diversity method of claim 7, wherein the step (a) comprises separately receiving as the feedback information the real part and imaginary part of an index corresponding to an element of a complex basis vector set for two feedback signaling intervals, and combining the real part and the imaginary part by way of sliding window.

10. (Original) The closed loop transmission antenna diversity method of claim 8, wherein the first and second basis vector sets are a Walsh basis vector set and a polar basis vector set, respectively.

11. (Original) In a mobile communication system, a base station apparatus, having a plurality of antennas for a closed loop transmission antenna diversity method employing a selective combining method, comprising:

a plurality of antennas for receiving selection information related to a complex basis vector from a mobile station as feedback information;

a feedback information decoder for determining a complex basis vector selected based on the selection information and obtaining an antenna weight for each antenna using the determined complex basis vector; and

a data transmitting unit for generating a signal based on the antenna weight and transmitting the signal to the mobile station through a corresponding antenna.

12. (Original) A mobile station apparatus for a closed loop transmission antenna diversity method employing a selective combining method when a plurality of antennas are used in a base station of a mobile communication system, the mobile station apparatus comprising:

a channel information measuring unit for measuring channel information from signals transmitted ~~received~~ through the plurality of antennas used in the base station and outputting a channel information matrix;

a basis vector transformer for transforming the channel information matrix according to a transform matrix composed of a complex basis vector set;

an optimum weight detector for calculating reception power with respect to the plurality of antennas based on the transformed channel information matrix and generating feedback information for ~~controlling transmission~~ antenna selection ~~diversity~~ based on the calculated reception power; and

an uplink signal processor for transmitting the feedback information to the base station in the form of a symbol configured according to a protocol suitable for feedback.

13. (Original) The mobile station apparatus of claim 12, wherein the basis vector transformer comprises:

a Walsh basis vector transformer for transforming the channel information matrix using a transform matrix composed of a Walsh basis vector set; and

a polar basis vector transformer for transforming the channel information matrix using a transform matrix composed of a polar basis vector set.

14. (Original) The mobile station apparatus of claim 12, wherein the optimum weight detector comprises:

first and second column adders each for adding elements in all columns in each row in the transformed channel information matrix and outputting a row vector;

a combiner for combining the outputs of the first and second column adders in all possible cases and outputting a combination matrix;

a power calculator for calculating power with respect to each element of the combination matrix; and

a maximum value detector for detecting a maximum value of the power with respect to each element and outputting an index of an element corresponding to the maximum value.

15. (Original) The mobile station apparatus of claim 12, wherein the uplink signal processor transmits antenna selection information and phase information as the feedback information.

16. (New) The closed loop transmission antenna diversity method of claim 1, wherein the complex basis vector set is an orthonormal vector set.

17. (New) The closed loop transmission antenna diversity method of claim 7, wherein the complex basis vector set is an orthonormal vector set.

18. (New) The closed loop transmission antenna diversity method of claim 11, wherein the complex basis vector set is an orthonormal vector set.

19. (New) The mobile station apparatus of claim 12, wherein the complex basis vector set is an orthonormal vector set.